

# (12) United States Patent Ujvari

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### (54) **PROXIMITY DETECTION**

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USPC ......... 324/76.11-76.83, 600, 605, 629, 647, 324/665, 672, 679, 705 See application file for complete search history.

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#### (57)ABSTRACT

In certain embodiments, a proximity sensor includes a sensing element, an oscillator connected to the sensing element, and control circuitry connected to the oscillator. The sensing element has a capacitance to ground that is variable as a function of the proximity of an object to the sensing element. The oscillator includes a capacitor. The control circuitry is configured to supply an excitation to the oscillator and a charge to the sensing element, and to measure the resonant frequency of the oscillator. The control circuitry provides a signal indicative of the proximity of the object to the sensing element.

## 20 Claims, 4 Drawing Sheets

